and volition to the more complex instinctive and reasoning faculties of higher animals.

Where, then, shall we draw the line in the evolution of mind between the high degrees of consciousness in animals, and self-consciousness, which is believed to be a peculiarly human attribute, and at the foundation of all that constitutes con-science and makes him a moral and responsible being? The beginnings of self-consciousness are traceable in animals, since many of the phenomena of sexual selection and the well-known sense of shame in our domestic associates could scarcely have resulted without it; and it seems to me illogical to argue, as some of our best writers on evolution have done, that self-consciousness is an attribute that must have been breathed into man by special, supernatural act.

From the consideration of the general subject of mind in nature, we are brought inevitably to the question of design. There can be no doubt that the tendency of evolution has been to remove further and further the idea of an infinite first cause. The argument for design, however, as Asa Gray has so well set forth, rests on the fact that the designed and the contingent can never be accurately discriminated, and that limitation, in the very nature of the case, is inconceivable. It seems to me that the evidences of design in nature are so overwhelming that its advocates have an immense advantage over those who would discard it. A fortuitous cosmos is, to most persons, utterly inconceivable; yet there is no other alternative than a designed cosmos.

The most philosophic view is probably that which, while recognizing an intelligent creative power, or mind, which has worked and is yet working through ordained laws, yet leaves the detailed manifestations to secondary causes and finite action. Limiting conditions or laws, since law is but a limiting condition and nature an active power, may act together in producing secondary causes, but the great and infinite cause may be looked upon as that which upholds the universe.

I have ventured just within the question of design, because of the prevalent belief that evolution eliminates it from our conception, and because I have felt that as between the extreme schools the middle ground chosen by our late lamented Gray is far the more satisfactory and philosophical. On the other great question of what life is, or how it originated, I commend the candor of Marsh in closing his address as president of the association in 1877 with the words, "In this long history of life I have said nothing of what life is; and for the best of reasons, because I know nothing." The genesis or formation of individual life, in spite of saint and sage, is yet a mystery, and probably always will be.

All that evolution recognizes is the transmutability — the generic identity — of the forces of nature, which, in their aggregate action, may properly be defined as omnipresent energy. We know, as a matter of the simplest observation, that this combined force or energy is essential to the continuance of life, not only upon our planet, but, deductively, in the universe. We are justified in inferring that it is capable, under fit conditions, of originating life from what we know as non-living matter. Evolution, in fact, inevitably leads to the inference that vital force is transmutable into, and derivable from, physical and chemical force.

SCHOOL OF BIOLOGY, UNIVERSITY OF VIRGINIA.

THIS school is founded upon the gift of one hundred thousand dollars by the late Samuel Miller of Lynchburg, Va., who provided that the income from this fund should be expended for "the advancement of agriculture as a science and as a practical art by the instruction therein, and in the sciences connected therewith, of the youth of the country."

A part of the income is used to maintain the work in agricultural chemistry, carried on in connection with the chemical department of the university, under the direction of Professors Mallet and Dunnington.

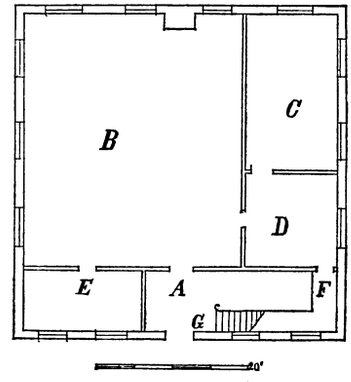
The residue, and the larger portion of the income, is to be expended in promoting instruction and research in biology. One floor of the medical hall (42 by 42 feet) is now being fitted up for a biological laboratory, including, as in the annexed plan, a laboratory-room for students, a private laboratory for the professor, a photographic room, and storerooms.

The equipment has already been ordered, and will consist of microscopes and dissecting-instruments for the students, microtomes, apparatus for staining and mounting preparations, photographic apparatus, instruments of precision for advanced researches, and a working library, and a file of periodical literature.

The instruction will be by lectures, with associated laboratory-work, and will cover general biology, zoölogy and comparative anatomy, and biology applied to agriculture.

PROF. ALBERT H. TUTTLE OF THE UNIVERSITY OF VIRGINIA.

The professor-elect is Mr. Albert H. Tuttle, recently professor of biology in the Ohio State University at Columbus. He was born in Summit County, O., in 1844, was graduated from the State College of Pennsylvania, taught for two years (1868–70) in the First State Normal College of Wisconsin, was graduate student and instructor in microscopy in the Harvard Museum of Zoölogy under Professor Agassiz (1870–72), travelled and studied in Europe (1872–74), and was professor in Ohio State University (1874–88). During one year of this period he was absent on leave as graduate student in the biological laboratory of Johns Hopkins University.



PLAN OF BIOLOGICAL LABORATORY.

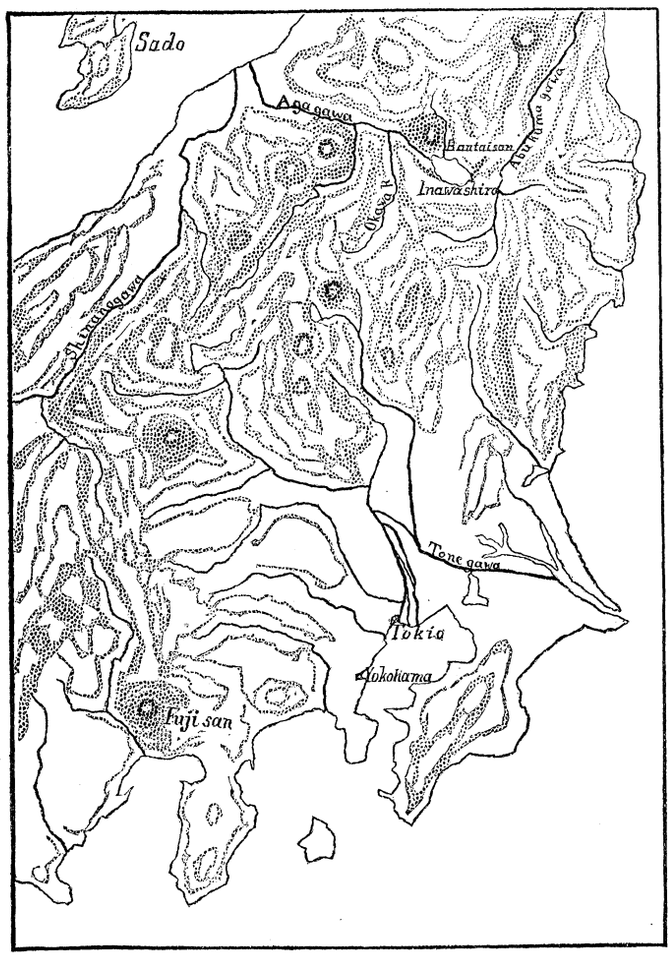
A, hall; *B*, student's laboratory (29′ × 34′); *C*, private laboratory (12′ 6″ × 21′); *D*, photographic room (12′ × 12′ 6″); *E*, storeroom (8′ 6″ × 16′); *F*, closet; *G*, stairway to physiological room.

In connection with the advanced work of agricultural students in chemistry and biology, Professors Dunnington and Tuttle will also conduct a small field-experiment station. On this the more hopeful lines of investigation into problems of practical agriculture will be carried out.

THE ERUPTION OF BANTAISAN.

ON the morning of July 15 occurred a phenomenon of such magnitude, and with results so serious, as to place it among the most remarkable events of volcanic origin of which record exists.

The place of eruption was the mountain of Bantaisan, situated about four miles and a half from Lake Inawashiro, and about a hundred miles directly north-west of Tokio, in latitude 37°36′ north and longitude 140°6′ east. The mountain is the terminal peak of a group of hills rising from an extensive plain, and attains an elevation of about 6,000 feet. Its summit is divided; and the lower or Sho-Bantaisan, with a height of about 5,000 feet, was the actual place of outburst.



The mountain is doubtless of volcanic origin, consisting largely of scoriaceous matter; mostly in a very much disintegrated condition, however. The immediate vicinity has, nevertheless, been the seat of active volcanic disturbance within historical times; though the great earthquake of 1611, and the formation of the lake near Banzai-ya in the location of a mountain which disappeared about 1760, are the most recent phenomena of the region distinctively volcanic in nature.

Bantaisan itself is supposed to have been formed in the year 807, as the result of an eruptive outburst; but there is no actual record of any period of volcanic activity, nor of any definite eruption, though the extinct crater is well defined, and ancient Japanese literature contains numerous allusions to the mountain as emitting flame and smoke.

This dearth of any actual record of eruption, taken together with the appearance of the mountain (which presents from the distance no evidence of former volcanic activity, and is clothed with verdure nearly to the very summit, oak-trees growing high up its sides, and only here and there showing projecting eruptive rock), leads to the inevitable conclusion that the mountain must have been free from actual eruptive phenomena for probably a thousand years. Indeed, one ancient writer asserts that Bantaisan ceased its existence as an active volcano with the origin of Lake Inawashiro.

Evidences of slumbering volcanic force remained, however, in the presence, at three different elevations on the mountain-sides, of extensive hot-springs, the visitors to which were among the chief sufferers from the calamity of July 15.

Premonitory symptoms of an unusual disturbance were first experienced on the 13th, and continued, in the shape of rumbling sounds and slight earthquake shocks, for two days and nights; yet the phenomena were not of such a nature as to cause apprehension, and the final catastrophe found the people of the vicinity wholly unprepared, and took them by surprise.

Definite information as to the exact nature of the occurrence, and accurate details concerning the phenomena actually appearing, are, from the nature of the case, the remoteness and comparative inaccessibility of the locality, and the character of the rural people chiefly affected, not yet procurable. But the facts as at present demonstrated appear to be as follows:—

About eight o'clock A.M. the residents of the villages around the base and sides of Bantaisan heard loud rumbling sounds, and experienced severe shocks of earthquake. These phenomena were immediately followed by the falling of showers of ashes, which darkened the sky when not illumined by flashes of dazzling flame, apparently emitted from the earth. Violent earthquakes shook the ground, and the crest of Sho-Bantaisan seemed to be lifted bodily upwards, fall again, and totally disappear, in the midst of a violent and deafening explosion.

This phenomenon was followed by showers of red mud, steam, boiling water, and large stones, but no gravel or small stones. Next followed a second shower of ashes mixed with mud, which continued till houses, thatched huts, were buried sometimes to a depth of twenty feet by the ingulfing mass. The phenomena continued in all their severity for about two hours, when the climax seemed to be reached, after which the forces seemed to gradually subside, till about four P.M., when they appeared to have spent their power, and the extent of the catastrophe could be discovered.

All crops for an average radius of five miles from the mountain were destroyed, and great damage was done by the damming of the Okawa River, and consequent inundation of an extensive region. The number of houses totally destroyed was 195, while 63 more were more or less damaged. The total number of deaths is placed at 600, and 476 bodies have been recovered. The number of injured thus far reported is 41, while 1,000 persons are supposed to have been rendered destitute.

Two craters were opened by the eruption, one of which occupies the site of the former upper spring on Sho-Bantaisan, about two miles from the former summit. The diameter of the crater thus formed is little less than five miles, and the mountain-peak above this elevation has wholly disappeared, while one other of the four cones has materially diminished in size. Both craters are at latest accounts, the 26th of July, still in a state of constant though quiet eruption, emitting smoke, steam, and occasionally ashes, the latter having the appearance of disintegrated rock of a dull-bluish color.

Though an eruption of Bantaisan has never been considered a probable event, and the recent phenomenon has had no local precedent, the mountain is situated on one of the four lines of volcanic activity known to exist in Japan, embracing a series of several active volcanoes; in the light of which fact, the eruption, with all its attending phenomena and ensuing disaster, cannot be regarded as either exceptional or matter for surprise, though possessing unusual scientific interest, and demanding the fullest human sympathy.

H. E. STOCKBRIDGE.